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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/549,280	09/13/2005	Tomas Rosin	5373-2	2458
23117 7590 05/21/2009 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203				
EXAMINER				
GOLIGHTLY, ERIC WAYNE				
ART UNIT		PAPER NUMBER		
1792				
MAIL DATE		DELIVERY MODE		
05/21/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary****Application No.**

10/549,280

**Applicant(s)**

ROSIN, TOMAS

**Examiner**

Eric Golightly

**Art Unit**

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21-41 is/are pending in the application.
- 4a) Of the above claim(s) 27 and 28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 21-26 and 29-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 21-41 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 February 2009 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

1. Applicant's response filed 2/26/2009 is acknowledged. Claims 21-41 are pending. Claims 27 and 28 are withdrawn.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 21-26 and 29-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 4,996,951 to Archer et al. (hereinafter "Archer") in view of US 5,591,895 to Rigby (hereinafter "Rigby") and in further view of US 6,325,025 to Perrone (hereinafter "Perrone").

Regarding claim 21, Archer teaches a method of cleaning heat exchange surfaces of a heat exchange system (abstract), comprising the steps of: leading an

exhaust stream by the heat exchange surfaces (col. 1, lines 14-23); and cleaning sequentially different parts of the heat exchange surfaces with cleaning equipment (col. 5, lines 51 and 52 and col. 7, line 55) having an operational status (col. 8, lines 25-30), wherein particles are released from the parts being cleaned (col. 7, lines 44-46)

Archer does not explicitly teach measuring the amount and/or type of released particles entrained with the exhaust gas stream so as to create particle measurement data and linking together and storing into an electronic memory the location information of the parts of the heat exchange surfaces being cleaned and the particle measurement data created during the cleaning so as to create information on the fouling on the heat exchange surfaces as a function of the location of the heat exchange surfaces. Rigby teaches a method for detecting particles in a gas flow (abstract), including measuring the amount and/or type of released particles entrained with the exhaust gas stream so as to create particle measurement data (col. 2, lines 55-59). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the step of measuring the amount and/or type of released particles entrained with the exhaust gas stream so as to create particle measurement data as per the method of the Rigby teaching in the method as per the Archer teaching in order to enhance the control of unwanted particulate emissions, e.g., alarm level for continuously monitored pollutant.

Archer and Rigby do not explicitly teach linking together and storing into an electronic memory the location information of the parts of the heat exchange surfaces being cleaned and the particle measurement data created during the cleaning so as to

create information on the fouling on the heat exchange surfaces as a function of the location of the heat exchange surfaces. Perrone teaches a sootblowing optimization method (abstract) and discloses linking together and storing in an electronic memory heat exchange parameters (col. 3, lines 54-64). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the step of linking together and storing into an electronic memory as per the method of the Perrone teaching the location information of the parts of the heat exchange surfaces being cleaned and the particle measurement data created during the cleaning as per the Archer/Rigby teachings so as to create information on the fouling on the heat exchange surfaces as a function of the location of the heat exchange surfaces since Archer and Rigby teach determining information on the fouling on the heat exchange surfaces as a function of the location of the heat exchange surfaces (Archer at col. 3, lines 46-68) and the linking data together and storing it in an electronic memory, e.g., in a database, is known and convenient, and would enhance operator ability to easily track and project the cleaning requirements of different parts and the historical effectiveness of the parts' respective cleaning operations.

Regarding claim 22, Archer, Rigby and Perrone disclose storing the operation parameter status into the electronic memory (Archer at Fig. 3, ref. 4 and 10 and col. 7, line 54-57 and col. 8, lines 10-14 and Perrone at col. 3, lines 54 and 55), and the skilled artisan would have found obvious the step of linking the operation parameter status together with the location information of the part being cleaned and the particle measurement data created during the cleaning of the part in order to since Archer,

Rigby and Perrone disclose the importance of linking together the heat exchange operation parameters to enhance optimization analysis, including cleaning (Perrone at col. 3, lines 51 to col. 4, line 16).

Regarding claim 23, Archer, Rigby and Perrone disclose using an operation parameter status which comprises location information of the cleaning equipment (Archer at col. 3, lines 6-9 and 46-66), operational status of the cleaning equipment (Archer at Fig. 3, ref. 4 and col. 7, line 54-57) and effect of the cleaning equipment (Archer at Fig. 3, ref. 10 and col. 8, lines 10-14).

Regarding claim 24, Archer, Rigby and Perrone disclose using cleaning equipment comprising a soot blower (Archer at Fig. 5, ref. 4 and col. 7, line 55). It is noted that this limitation concerns apparatus structure and does not appear to be critical to the performance of the claimed method steps.

Regarding claim 25, Archer, Rigby and Perrone disclose using cleaning equipment comprising a steam based soot blower (Archer at col. 1, 41-45), which is a mechanical cleaner.

Regarding claim 26, Archer, Rigby and Perrone disclose the measuring step comprises measuring the mass flow of particles in the exhaust gas stream (Rigby at col. 1, lines 53-55).

Regarding claim 29, Archer, Rigby and Perrone disclose optimizing the operation parameters for the cleaning of different parts of the heat exchange surfaces by using the information of the fouling as a function of the location of the heat exchange surfaces (Archer at col. 3, lines 46-68 and col. 8, lines 6-30).

Regarding claim 30, Archer, Rigby and Perrone disclose the optimizing is based on a carbon content in the ash (Archer at col. 8, lines 1-5).

Regarding claims 31 and 32, Archer, Rigby and Perrone disclose using the information of the fouling as a function of the location of the heat exchange surfaces for estimating the tendency and distribution of fouling on the heat exchange surfaces (Archer at Fig. 5, especially ref. 10, 16 and 18 and col. 8, lines 10-50).

Regarding claim 33, Archer, Rigby and Perrone disclose measuring particles on a cross-section of an exhaust gas channel (Rigby at Fig. 2, and col. 3, lines 53 and 54), but do not explicitly teach measuring a particle distribution on a cross-section of an exhaust gas channel. However, the skilled artisan would have found it obvious to measure a particle distribution on a cross-section to further enhance the cleaning process since it is known that the distribution affects the particle deposition thickness for a given cross-section, which thickness and cross-section relationship is taught by Archer, Rigby and Perrone (Archer at col. 3, lines 46-66). Further, skilled artisan would have found it obvious to compare the measured data of the particle distribution with previous measurements and using the result of the comparison in determining the distribution and tendency of fouling on the heat exchange surfaces since Archer, Rigby and Perrone disclose using particle deposition comparison data for determining the distribution and tendency of fouling on the heat exchange surfaces (Archer at Fig. 5, especially ref. 10 and 18 and col. 8, lines 10-50).

Regarding claim 34, Archer, Rigby and Perrone disclose the method wherein measuring of the amount and/or type of the released particles in the exhaust gas stream

is made with an electric charge transfer measurement system (Rigby at col. 1, lines 36-40).

Regarding claim 35, Archer, Rigby and Perrone disclose producing AC and DC signals representing particles in the exhaust gas stream (Rigby at col. 6, line 57 to col. 7, line 3) by the electric charge transfer measurement system, but do not explicitly teach determining the tendency and distribution of fouling on the heat exchange surfaces by using the AC and DC signals. However, the skilled artisan would have found it obvious to determine the tendency and distribution of fouling on the heat exchange surfaces by using the AC and DC signals since Archer, Rigby and Perrone disclose that the signals are useful for indicating mass flow rate (Rigby at col. 6, lines 57-59), which is a factor in determining the distribution and tendency of fouling on the heat exchange surfaces.

Regarding claim 36, Archer, Rigby and Perrone disclose producing AC and DC signals by the electric charge transfer measurement system (Rigby at col. 6, line 57 to col. 7, line 3), but do not explicitly teach using the signals to estimate the amount of unburned carbon in the ash flow in the exhaust gas stream. However, the skilled artisan would have found it obvious to use the signals to estimate the amount of unburned carbon in the ash flow in the exhaust gas stream since Archer, Rigby and Perrone teach that ash analysis and an ultimate analysis (Archer at col. 8, lines 2-5), which includes carbon, are factors in optimizing the cleaning (Archer at col. 8, lines 30-35).

5. Regarding claims 37 and 40, Archer teaches a system for cleaning heat exchange surfaces of a heat exchange system (abstract), comprising: cleaning equipment comprising a soot blower (Fig. 5, ref. 4 and col. 7, line 55), which is fully capable of being arranged to sequentially clean different parts of the heat exchange surfaces, so as to release particles from the cleaned parts of the heat exchange surfaces (col. 7, lines 44-47 and col. 8, lines 25-30).

Archer does not explicitly teach a means for measuring the amount and/or type of released particles and a means for linking together and storing in electronic memory the location information on parts of the heat exchange surface and particle measurement data. Rigby teaches a system for detecting particles in a gas flow (abstract), including a means for measuring the amount and/or type of released particles in the exhaust gas stream (Fig. 1, especially ref. 1, Fig. 2, especially ref. 6, 8 and 9, and col. 3, lines 17-55). It would have been obvious to one of ordinary skill in the art at the time of the invention to include a means for measuring the amount and/or type of released particles in the exhaust gas stream as per the system of the Rigby teaching in the system as per the Archer teaching in order to enhance the particle removal process control, since it is known that combustion gases contain particles which form undesirable deposits (Archer at col. 1, lines 23-40). The system as per the Archer/Rigby teachings is fully capable of being used to create particle measurement data.

Archer and Rigby do not explicitly teach a means for linking together and storing in electronic memory the location information on parts of the heat exchange surface and

particle measurement data. Perrone teaches a sootblowing optimization system (abstract) and discloses a means for linking together and storing in an electronic memory comprising a processor and database (col. 3, lines 54-64). It would have been obvious to one of ordinary skill in the art at the time of the invention to include a means for linking together and storing in an electronic memory as per the system of the Perrone teaching in the system as per the Archer/Rigby teachings since databases are known, widely available, and convenient for storing operating parameters or other data. The means for linking together and storing in an electronic memory as per the system of the Archer/Rigby/Perrone teachings is fully capable of being used to link together and store the location information of the parts of the heat exchange surface being cleaned and the particle measurement data created during the cleaning of the parts so as to create information of the fouling on the heat exchange surfaces.

Regarding claim 38, Archer, Rigby and Perrone disclose a means for detecting an operation parameter status of the cleaning equipment (Archer at Fig. 3, ref. 4 and 10 and col. 7, line 54-57 and col. 8, lines 10-14).

Regarding claim 39, Archer, Rigby and Perrone disclose a means for controlling the cleaning equipment on the basis of the information of the fouling on the heat exchange surfaces (Archer at Fig. 3, ref. 4 and 10 and col. 7, line 54-57 and col. 8, lines 10-14).

Regarding claim 41, Archer, Rigby and Perrone disclose the system wherein the cleaning equipment comprises a steam based soot blower (Archer at col. 1, 41-45), which is a mechanical cleaner.

***Response to Amendment***

6. The objections to the drawings and claims are withdrawn in view of the amendment.

***Response to Arguments***

7. Applicant's arguments filed 2/26/2009 have been fully considered but they are not persuasive

Applicant's apparent argument that Archer (US 4,996,951) teaches away from linking together the location information of parts being cleaned and particle measurement data created during the cleaning so as to create information on fouling of heat exchange surfaces because, it is alleged, Archer discloses using a model to estimate a soot layer thickness (remarks at page 10, is unpersuasive. Assuming, arguendo, applicant is correct regarding the Archer model, the skilled artisan would not have to abandon such a model in order to create information on fouling by linking together the parts location information of parts being cleaned and particle measurement data created during the cleaning. Rather, accurate fouling information could be obtained by considering both approaches.

In response to applicant's arguments against the references individually (remarks at page 11, first through third paragraphs), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck &*

Co., 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As discussed in the prior Office action (see prior Office action at page 4, last paragraph), Rigby (US 5,591,895) is applied to supply the feature of measuring particles so as to create particle measurement data (Rigby at col. 2, lines 55-59), rather than Perrone (6,325,025). Perrone is applied to supply the feature of linking together and storing in electronic memory heat exchange parameters (see prior Office action at page 5, first paragraph, citing Perrone at col. 3, lines 54-64). Further, it is Archer, rather than Perrone, which discloses determining information on the fouling on the heat exchange surfaces as a function of the location of the heat exchange surfaces (see prior Office action at page 5, first paragraph, citing Archer at col. 3, lines 46-68). Accordingly, Rigby cannot be individually attacked for not supplying the linking feature (remarks at page 11, third paragraph), since it is Perrone which is applied to supply this feature (prior Office action at page 5, first paragraph, citing Perrone at col. 3, lines 54-64).

Applicant's broad argument that there is no suggestion to combine the Rigby and Perrone references (remarks at page 11, last paragraph) is based upon applicant's broad assertion that no other applied references disclose the features of the present claims. This assertion is not conceded, as discussed in this section and in the section "Claim Rejections - 35 USC § 103".

Applicant's first more specific argument that there is no suggestion to combine the Rigby and Perrone references (remarks at page 12, fourth paragraphs), again attacks Perrone individually as not disclosing the feature of storing *particle measurement* data in memory. In short, and as discussed above, Perrone is not relied

upon for particle measurement data. Applicant is invited to provide guidance as to the location in the applied references where applicant has found the teaching that there is no correlation between particle measurement data and operation parameters.

Applicant's second more specific argument that there is no suggestion to combine the Rigby and Perrone references contends that the skilled artisan would have no reason, on the basis of the applied references, to link together the location information on the parts of the heat exchange surfaces being cleaned and the particle measurement data (remarks, paragraph bridging pages 12 and 13). Assuming, *arguendo*, applicants are correct regarding their being no suggestion to combine within the references themselves, it is noted that the skilled artisan would nevertheless have had motivation to combine in order to easily and conveniently track and project the cleaning requirements of different parts and the historical effectiveness of the parts' respective cleaning operations, as discussed in the prior Office action at page 5, first paragraph). Further, the skilled artisan would have been motivated to combine the teachings in order to enhance the control of unwanted particulate emissions (prior Office action at page 4, last paragraph), e.g., to detect and locate parts with especially excessive fouling for troubleshooting efforts.

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric Golightly whose telephone number is (571) 270-3715. The examiner can normally be reached on Monday to Thursday, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Komakov can be reached on (571) 272-1303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EWG

/Michael Kornakov/

Supervisory Patent Examiner, Art Unit 1792